

1948



AIR CONDITIONING FURNACE SERIES 10



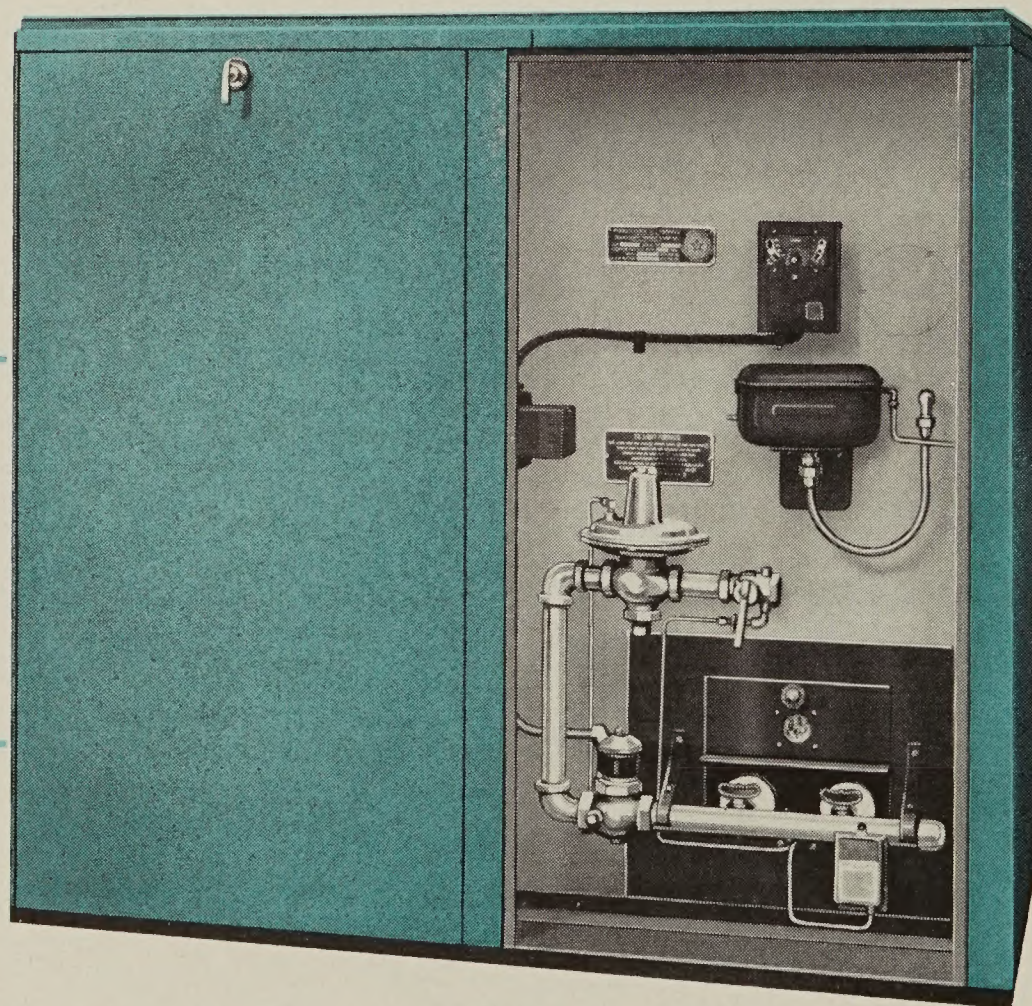
Bulletin
NO. 20

PENNSYLVANIA FURNACE & IRON CO., WARREN, PA.

Modern **AIR CONDITIONING FURNACE** *by* **PENNSYLVANIA**

Through years of development work in gas heating and continuous improvement in engineering, Pennsylvania now presents the Series 10 Air Conditioning Gas Furnace. This bulletin describes fully every feature of this modern heating system.

Many Pennsylvania furnaces are in service today after twenty-five years continuous use. No other gas furnace has such a background—sixty years devoted exclusively to building gas furnaces. These years of experience have brought forth new and improved engineering features. Not least of them is the ease of installation, fewer parts to assemble, panels designed with slip joints to save time and labor, manifolds and controls shipped completely assembled. All these improvements mean more profit for the dealer and economy for the user.



High Efficiency

The many-faced heat exchanger with large surface rapidly extracts maximum heat from flue gas on long upward travel to flue. This, with scientifically designed burners and double-insulated casing, contributes to the extremely high efficiency of the Series 10 Furnace.

Automatic Operation

Simplified automatic controls maintain uniform room temperature day and night. When the automatic pilot is lighted in the fall, and the thermostat set at the desired room temperature, the furnace will function indefinitely. Servicing is reduced to a minimum.

AN IMPROVED MODEL

The Series 10 Furnace is designed for installation in homes with a finished modern basement or a first floor utility room. All working parts and controls are enclosed and concealed within the attractive enameled cabinet. The cabinet is finished in two-tone smooth blue enamel with chrome plated trimmings.

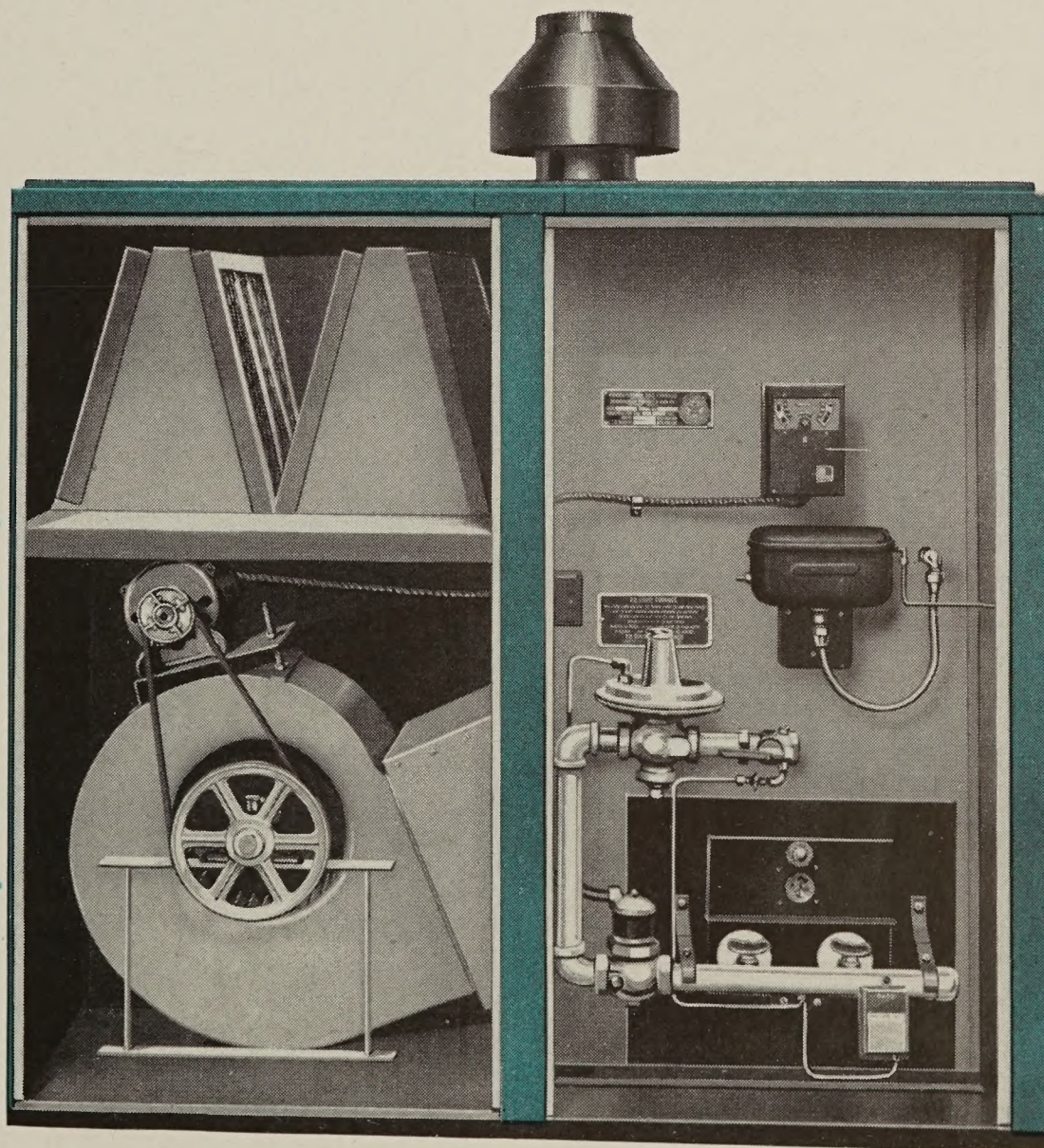
RANGE OF SIZES

In selecting a furnace of proper size for the heating of a building, it is important that the furnace be of correct capacity. A wide range of sizes, from 72,000 to 265,000 B. T. U. input, is available in this series. While these furnaces are particularly desirable for residence installation, they are equally suited for the heating of stores, schools, churches, and any type of building where clean, healthful, air conditioning at reasonable cost is desired.

COMPACTNESS

This furnace is so designed that it requires a minimum of height and floor space, with no controls extending out from the casing. This compactness fits the Series 10 Furnace into space-saving furnace rooms.

Modern AIR CONDITIONING FURNACE by PENNSYLVANIA



Attractive in Design and Finish

In modern homes, basements often become recreation rooms or even living quarters. Pennsylvania Air Conditioning Furnaces are finished as attractively as the furniture—a two-tone blue enamel finish that may easily establish a color scheme for the room, and harmonize with most styles of decorating.

Economical

High in quality of workmanship and of operation, the Pennsylvania is priced well within the reach of families of moderate means. The cost of operation is low because of the high efficiency obtained in its design and the simplicity of installation add other economies to the original cost.

DESCRIPTION OF SERIES 10

IMPROVED HEATING UNIT

An all steel combustion chamber and corrugated tube radiator form the integral heating unit. The radiator is so designed that all flue gases must travel in an upward manner, eliminating any possibility of back draft and condensation. A special baffle near the top of the radiator distributes the flue gases equally through each tube of the radiator. The air to be heated contacts all parts of the heating surface, contributing to the high efficiency of this unit.

Each seam of the combustion chamber and the radiator is continuously welded, making all joints gas-tight. There is no possibility of flue gases entering the conditioned air stream.

BURNERS and CONTROLS

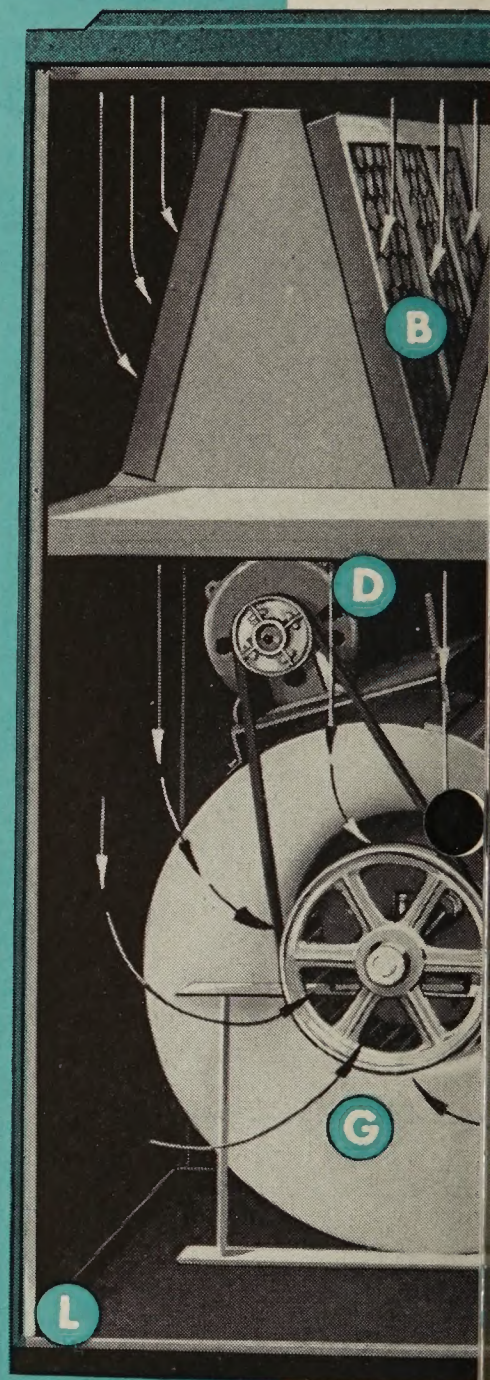
Scientifically designed, cast iron burners are sized according to the volume and kind of gas they are required to burn. Each port is raised above the body of the burner, to assure the correct amount of secondary air to each individual flame. Venturi injection tubes supply primary air in correct proportion for proper combustion, and govern the velocity of the gas mixture to the burners. With this type of burner and nipple assembly, flash backs are prevented and operation is noiseless. Controls, governed by a room thermostat, are entirely automatic.

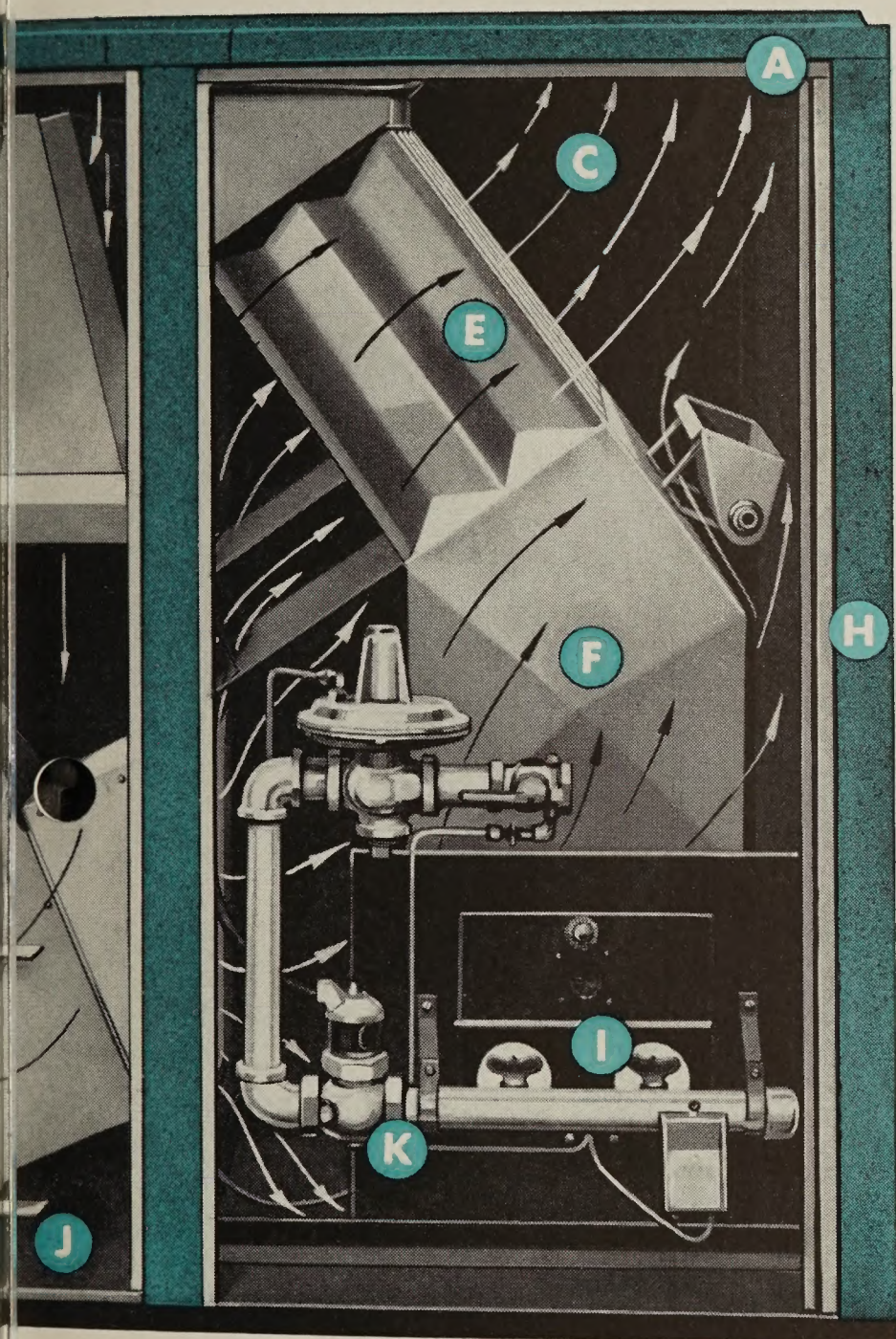
Pennsylvania furnaces will operate efficiently with any type of gas—natural gas, manufactured gas or L. P. (bottled) gas. It is important that the type of gas to be used be specified as a special type of burner and control is furnished for each type.

BLOWER

A multiblade, centrifugal type blower with double inlet and single bottom discharge delivers the rated C. F. M. against a static resistance of .2" water. Each blower is equipped with special self-aligning, thermoporous bearings, which automatically deliver oil to the shaft and prevent oil leakage when the blower is not operating. Large oil reservoirs make frequent oiling unnecessary. Rubber mountings eliminate vibration and insure quiet operation. The blower operates at comparatively low speed and avoids air noise.

- A** Insulated Cabinet
- B** Oversize Filters
- C** Continuous Flow of Humidified Filtered Air
- D** Rubber Cushioned Motor
- E** Superior Heat Exchanger
- F** Extra High Efficiency Combustion Chamber
- G** Noiseless Blower
- H** Beautiful Two-tone Finish
- I** Specially Designed Central Feed Burner
- J** Bottom Plate Shuts Out Basement Dirt
- K** Automatic Control
- L** Casing Joints "Tailored" to Fit Tight





MOTOR

Motors of one-quarter horsepower and smaller are split phase type and are equipped with a built-in motor overload protector. As the temperature in the motor increases above a predetermined limit, the motor cuts out, and as the temperature decreases it automatically resets and restores the motor circuit. Motors of one-third horsepower and larger are the capacitor type. Each is furnished with a circuit breaker which will cut out the motor circuit when overloaded.

CASING

The entire insulated casing is built of heavy gauge steel, with the exterior surface having a baked enamel finish. The part of the casing which encloses the heat exchanger and radiator is completely insulated with asbestos, dead air space, and metal lining, to assure a minimum heat loss. Sections of the casing are manufactured with tight fitting slip joints which prevent air leakage from the blower pressure.

The casing top fits on the casing with slip joints and is made with special flanged openings for the warm air and return air plenum chambers. A tight fitting filter rack is placed in the return air chamber and air passing to the blower must go through these filters. No unfiltered air is allowed to pass through the furnace.

Filters of special design remove the greater part of dust and dirt from the air stream. By providing a filter of slight density at the intake side, coarse dirt particles are removed first, and the finer particles eventually taken from the air at the discharge side. By graduating the density of the filters, greater storage space is provided for these dirt particles. The filters are of spun glass and are removable. The number of filters used in each furnace is dependent upon the size of the furnace, but is ample to avoid frequent renewal or excessive air resistance.

The new Series 10 Furnace is designed with two doors at the front of the casing to give easier access to the controls, burners, motor, blower, and filters.

A harmonizing shade of blue enamel, cadmium plated trim and streamline design contribute to the beauty of the Series 10 Furnace.

Automatic Humidifier

A porcelain-lined steel evaporating pan is placed on the side of the combustion chamber in such a position that the heated air will pass over the entire surface of the pan assuring the maximum amount of evaporation. Water is supplied to this pan through a copper tank located on the outside of the furnace. This tank is equipped with a water valve and float which maintains the proper water level. Water is supplied to the outside tank through copper tubing connected to any cold water supply line.

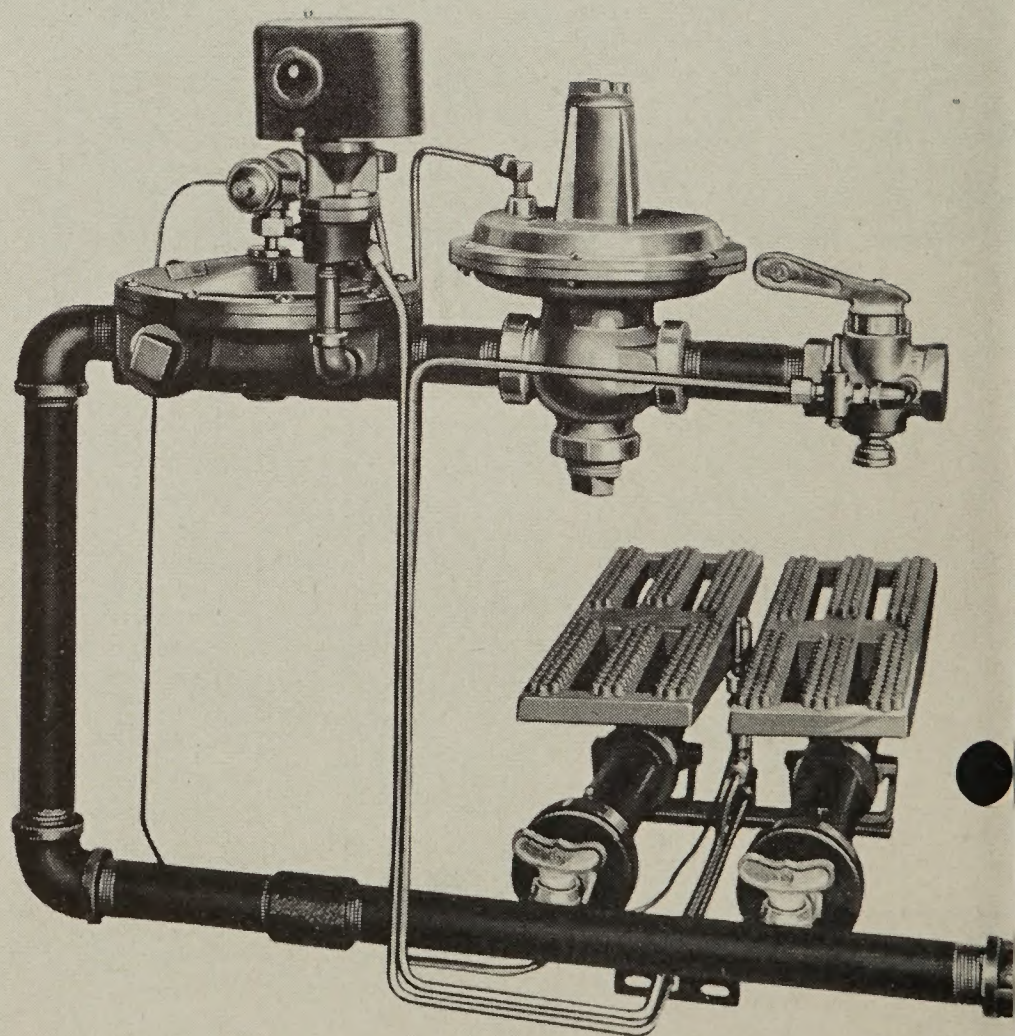
If a fixed percentage of humidity is desired at all times, a humidistat, water valve and strainer must be used. The humidistat, which can be located near the room thermostat, operates a water valve in the supply line which controls the amount of water to be evaporated.



Draft Diverter

● Every flue connected appliance should be equipped with an effective draft hood. With the Pennsylvania draft diverter, flames are not affected by either strong up-drafts or bad down-drafts. It has successfully passed more stringent draft tests than any other diverter. During one test, air compressed to several atmospheres was released into the outlet of the Pennsylvania diverter without affecting the operation of the burners in the furnace to which it was attached.

CLASS F CONTROLS



Controls

CLASS E CONTROLS WITH SOLENOID VALVE

● Controls of this class include lever handle shut-off valve, gas pressure regulator, solenoid control valve and safety pilot.

The supply of gas to the burner is controlled by the solenoid valve, this valve being operated by the room thermostat. The main burners are ignited by a safety pilot which burns constantly. The pilot flame impinges upon the thermocouple tip which converts heat energy into electrical energy, and this energy is conducted through a thermocouple lead to a magnetic coil in the safety pilot switch box.

The snap switch in the switch box is connected to the electric control circuit and is held closed as long as the magnet is energized by the pilot flame. Upon failure of this flame, the magnet will immediately dissipate its energy and open the electric circuit causing the main control valve to close.

CLASS E CONTROLS WITH MOTORIZED GAS VALVE

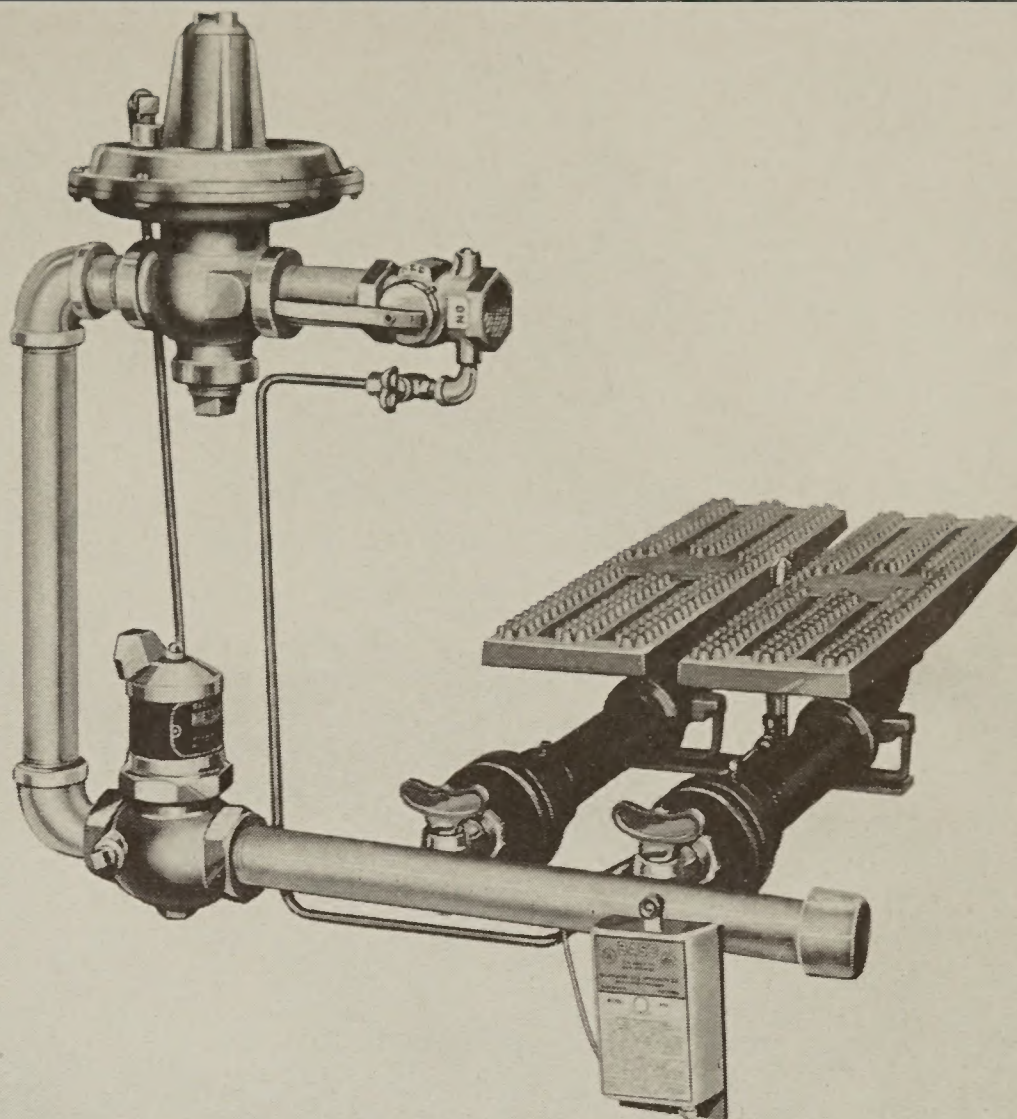
● This class of controls operates the same as the above class E, the difference being in the type of control valve furnished. The motorized valve is motor operated in the Series 10, 3-wire low voltage. The operation of the safety pilot is the same as described above for the Class E.

CLASS F CONTROLS

● Controls of this class include lever handle shut-off valve, gas pressure regulator, solenoid pilot valve, safety pilot, and diaphragm cut-off valve.

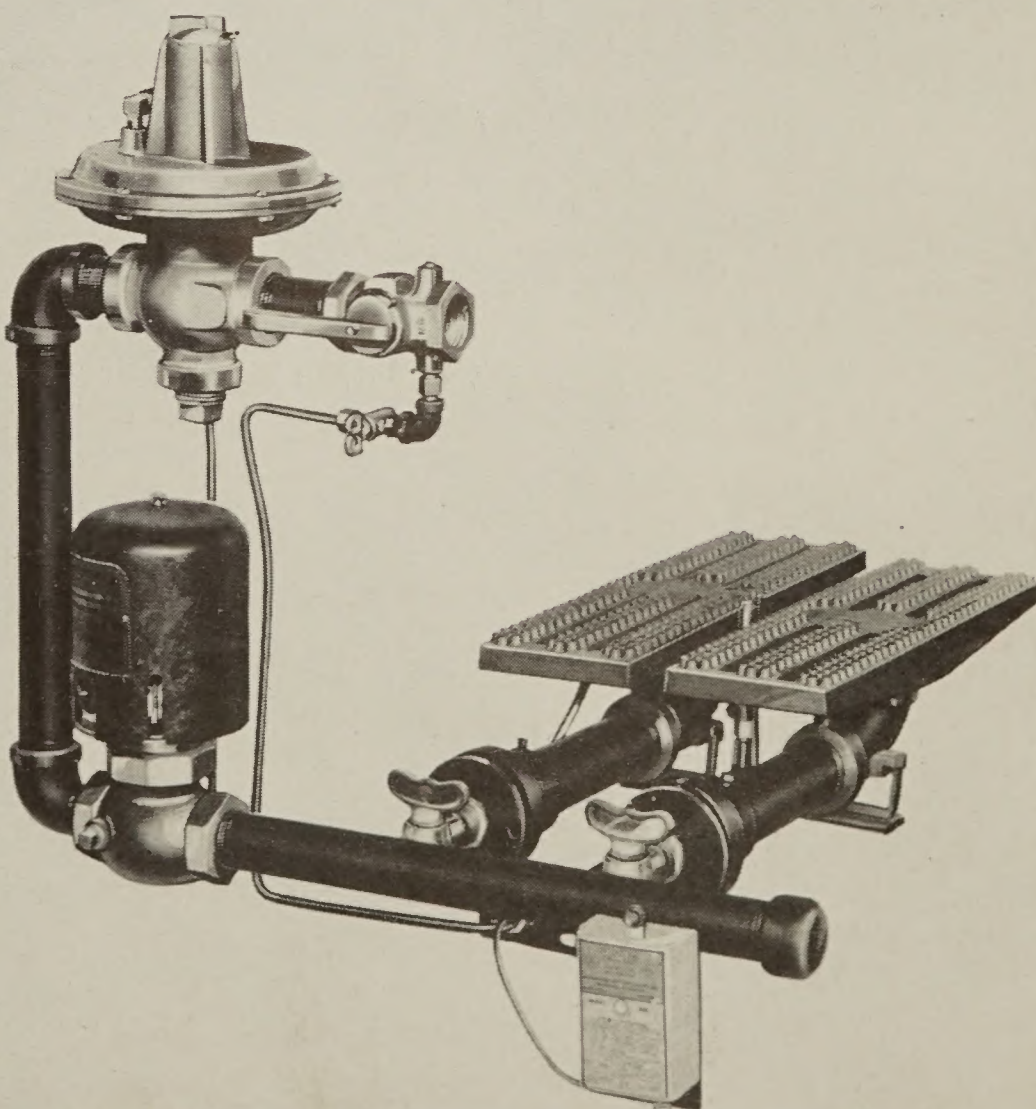
This class of controls is gas actuated. The supply of gas to the burners is controlled by a solenoid pilot valve and diaphragm cut-off valve. These valves are operated by the room thermostat. When the room thermostat requires heat the solenoid pilot valve will close, thus releasing the gas pressure from the top of the diaphragm valve permitting it to open. The main burners are ignited by a safety pilot which burns constantly. This action is reversed when the room thermostat is satisfied.

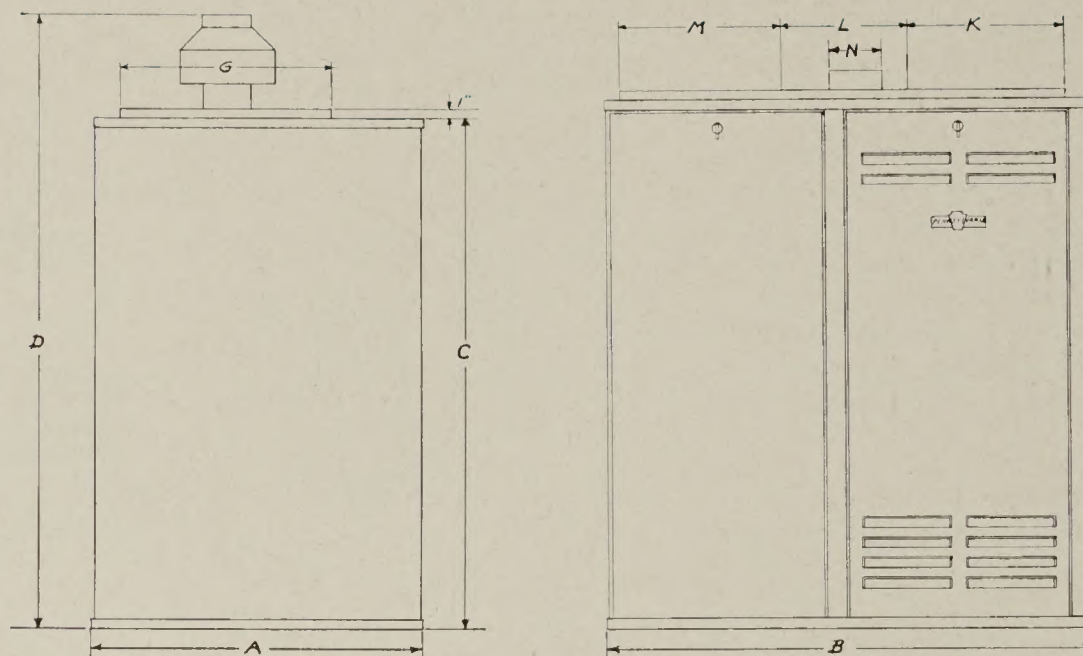
The pilot flame impinges upon the thermocouple tip which converts heat energy into electrical energy and this energy is conducted through a thermocouple lead to a magnetic coil in the safety pilot valve. This valve is connected to the top of the diaphragm valve and is held closed as long as the magnetic coil is energized by the pilot flame. Upon failure of this flame the magnetic coil will immediately dissipate its energy and open the pilot valve which will admit gas through the valve to the top of the diaphragm causing it to close.



CLASS E CONTROLS WITH SOLENOID VALVE

CLASS E CONTROLS WITH MOTORIZED GAS VALVE





DIMENSIONS AND SPECIFICATIONS

Furnace Size	A	B	C	D	G	K	L	M	N	Control Size Nat.	Control Size Mfg.	No. of Burners	Motor H.P.	Blower Size	No. of Filters
10-72	29	46	49½	67¾	18	16	9	16	4"	¾	¾	1	1/6	11	2-16x25
10-95	33¼	51	49½	67¾	21	16	11	16	5"	¾	1	1	1/6	11	3-16x25
10-120	36½	54	49½	67¾	24	16	14½	16	6"	1	1	2	1/4	12	4-16x25
10-145	41¼	55¼	49½	67¾	28	16	15¾	16	6"	1	1	2	1/3	12	5-16x25
10-175	50	62½	49½	72½	34½	19	16	19	6"	1	1¼	2	1/3	16	6-16x25
10-220	60½	60	51½	69¾	45	19	15	19	2-5"	1¼	1¼	2	1/3	2-12	6-20x20
10-265	62½	63½	51½	69	47	20	15½	20	2-6"	1¼	1½	4	1/2	2-14	6-20x20

Motors are equipped with adjustable pulleys, permitting regulation of R. P. M. to meet duct conditions in building.

Capacities of Furnaces in B. T. U. per Hour

Furnace No.	B. T. U. Input	A. G. A. Rating	Heat Available at Registers	C. F. M.
10-72	72,000	57,600	54,720	720
10-95	95,000	76,000	72,200	950
10-120	120,000	96,000	91,200	1200
10-145	145,000	116,000	110,200	1450
10-175	175,000	140,000	133,000	1750
10-220	220,000	176,000	167,200	2200
10-265	265,000	212,000	201,400	2650

Motors are 60 cycle. 25 cycle can be furnished where necessary, if so ordered.

Specify class of controls desired. Also, B. T. U. value of gas and kind, as natural, mixed, or artificial.

PENNSYLVANIA FURNACE AND IRON CO.
Warren, Penna.